

A composition and a process for using the composition in a selective hydrogenation of a highly unsaturated hydrocarbon such as, for example, an alkyne or diolefin, to a less unsaturated hydrocarbon such as, for example, an alkene or a monoolefin, are disclosed. The composition comprising palladium, a selectivity enhancer and an inorganic support wherein the palladium and selectivity enhancer are each present in a sufficient amount to effect the selective hydrogenation of a highly unsaturated hydrocarbon. Optionally, the composition can comprise silver. Also optionally, the palladium is present as skin distributed on the surface of the support. The composition can further comprise an alkali metal-containing compound such as, for example, potassium fluoride.